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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,491	04/02/2001	Chen-Jung Chien	HT2000-002	8580
28112	7590	05/18/2005	EXAMINER	
GEORGE O. SAILE & ASSOCIATES 28 DAVIS AVENUE POUGHKEEPSIE, NY 12603			DAVIS, DAVID DONALD	
			ART UNIT	PAPER NUMBER
			2652	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/822,491

Applicant(s)

CHIEN ET AL.

Examiner

David D. Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 1-14 are now subject to being rejoined because applicant arguments have been found persuasive.

### ***Claim Rejections - 35 USC § 112***

2. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically in line 7 of claim 1, “a spin-valve GMR sensor element “ is indefinite because it is unclear as to whether the GMR sensor element in lines 1-2 of claim 1 are referenced or an entirely different element.

In line 13 of claim 1, “hard magnetic longitudinal bias layer” is set forth in lines 13 and 14. However, it is unclear as to whether the layer in line 2, for example, is referenced or an entirely different layer. Similar indefiniteness exists in claim 8.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shen et al (US 5,742,459). Shen et al shows in figure 1 and describes in column 5, lines 62-64 a spin valve abutted junction GMR sensor element 25. Element 25 has a thinner hard magnetic longitudinal bias layer 52 having significantly improved magnetic properties in the junction region.

Figures 1 of Shen et al also shows substrate 16. First seed layer 27 for element 25 is formed over substrate 16. Element 25 is formed over seed layer 27 as shown in figure 1. Surfaces for abutted junctions are in GMR sensor 25 and first seed layer 27. Figure 1 continues to show a lattice matching second seed layer 45 for a hard magnetic bias layer 52 is over the surfaces abutted junctions. Second seed layer 45 completely covers the surfaces.

Figure 1 additionally shows hard magnetic longitudinal bias layer 52 formed over the lattice matching second seed layer 45. An undersurface of bias layer 52 contacts only the layer 45. Figure 1 further shows conducting lead layer 62 or 63 formed over bias layer 52.

Shen et al discloses, in column 3, lines 27-45 that seed layers 27 & 45 are tantalum (Ta) or chromium molybdenum (CrMo) with a thickness between 50 to 25 Angstroms. Shen et al discloses in column 4, lines 19-32 that hard bias layer 50 or 52 is CoCrPT or CoPt or CoCrTa with a thickness between 50 and 1000 Angstroms (see the thickness or relative layer 25 in column 5, lines 5-15).

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Shen et al, however, is silent as to etching. Shen et al is also silent as to the seed layer being NiCr or NiFeCr.

Official notice is taken of the fact that NiCr and NiFeCr are notoriously old and well-known seed layers utilized in GMR heads.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the GMR layers of Shen et al. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to etch GMR layers so that the sensor would operate as intended because etching, which is defined as cutting into a surface with acid, effectively and efficiently shapes the layers.

It also would have been obvious to a person having ordinary skill in the art at the time the invention was made to substitute the seed layer of Shen et al formed from Ta with either NiCr or NiFeCr as taught in the art. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to substitute a seed layer formed from Ta with NiCr or NiFeCr, which is well within the purview of a skilled artisan and absent and unobvious result, because the seed layer materials are considered to be art recognized equivalents easily interchanged based on the desired optimization of the GMR head.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

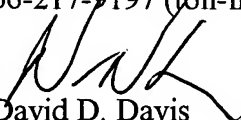
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Davis whose telephone number is 571-272-7572. The examiner can normally be reached on Monday thru Friday between 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David D. Davis  
Primary Examiner  
Art Unit 2652

ddd